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EE 428
Lab 3.1

1. I would guess my camera has an FOV of 50 degrees.
2. Height of iPhone (H) = 146.7 mm
   Distance from camera (D) = 220 mm
   Image height of iPhone (h) = 585 pixels

$$f = \frac{hD}{H} = 585 \times \frac{220}{146.7} = 877.3 \text{ pixels}$$

$$\theta = 2tan^{-1}\frac{W}{2f} = 2tan^{-1}\frac{720}{2(877.3)} = \textbf{44.62 degrees}$$

3. OpenCV Results:

```
intrinsics matrix:
[[951.2746767    0.         507.349064  ]
 [  0.         951.2746767  361.79644282]
 [  0.           0.           1.        ]]
distortion coefficients: [[0. 0. 0. 0. 0.]]
```

field-of-view according to OpenCV's estimate of the focal length:

$$\theta = 2tan^{-1}\frac{W}{2f} = 2tan^{-1}\frac{720}{2(951.27)} = \textbf{41.46 degrees}$$